

# Instructional Resource List

## Industrial Manufacturing

CIP # 15.0600

**Please note:** This list of instructional resources is provided as a tool and not an endorsement by the Arizona Department of Education.

### **Books:**

- Engineering
- Manufacturing
- Mathematics and Measurement
- Metals
- Plastics
- Prints and Documents
- Quality
- Software
- Systems: Electrical/Electronic
- Systems: Mechanical
- Systems: Power
- Employability Skills
- Career Planning

### **Arizona Resources:**

- miscellaneous categories

### **Websites:**

- Associations
- Career Exploration
- Curriculum Resources
- Engineering
- Journals and Magazines
- Manufacturing
- Non Traditional Student
- Safety
- Software

## Books

### Engineering

#### **Basic Engineering Data Collection and Analysis, 1e (2001)**

**Vardeman, S.B. & Jobe, J.M.**

Thomson Delmar Learning <http://www.delmarlearning.com/>

**Reference only: Appropriate for students in introductory engineering statistics courses. The authors stress the practical issues in data collection and the interpretation of the results. Comb Binding**

ISBN/ISSN: 0-534-36957-X

#### **Exploring Engineering : An Introduction to the Art and Science of Engineering (2006)**

Kosky, P., Wise, G., Balmer, R.T. & Keat, W.D.

Academic Press <http://www.academicpress.com/>

ISBN/ISSN: 0123694051

#### **How the New Technology Works, 2e (1998)**

**Robert J. Cone, R.J. & Barnes-Svarney, P.**

Harcourt Brace Greenwood <http://www.greenwood.com/>

Nontechnical reader will find the text easy to follow without any trace of talking down to the reader.

ISBN/ISSN: 1-57356-138-X

#### **Introduction to Statistical Quality Control, 5e (2001)**

Montgomery, D.C.

John Wiley <http://www.wiley.com/WileyCDA/>

Book provides comprehensive coverage of the subject from basic principles to state-of-art concepts and applications.

ISBN/ISSN: Text 0-471-65631-3

ISBN/ISSN: Workbook 0-471-31828-0

#### **Manufacturing, Engineering & Technology (5th Edition) (2005)**

by Serope Kalpakjian, Steven Schmid

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

Intended for students of manufacturing in manufacturing, mechanical, or industrial engineering programs at both the Associate Degree or Bachelor Degree level.

ISBN/ISSN: 0131489658

#### **Manufacturing Processes for Engineering Materials, 4e (2002)**

Kalpakjian, S., & Schmid, S.R.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

This engineering textbook describes the materials and processes commonly used for manufacturing products, with chapters on the properties of metals and polymers, heat treatment, joining and fastening, and automation of manufacturing systems. Case studies from industry illustrate the concepts.

ISBN/ISSN: 0130408719

**Operations Management, 7e (2003)**

Heizer, J. & Render, B.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

The text is about average in terms of readability in comparison to other texts on the subject, and there are plenty of real-world examples to illustrate OM concepts

ISBN/ISSN: 0131406388

**Project Management (2002)**

Gray, C.F. & Larson, E.W.

McGraw-Hill <http://books.mcgraw-hill.com/>

Training manual and reference for understanding and managing every aspect of the project environment.

ISBN/ISSN: 0071376011

**Project Management: A Systems Approach to Planning, Scheduling, and Controlling (2003)**

Harold Kerzner, H.

John Wiley <http://www.wiley.com/WileyCDA/>

Text/reference for undergraduate or graduate courses in both business and engineering, as well as for functional managers and upper-level executives who must provide continuous support to all projects. It explains the characteristics of every size and type of group, presents the basics of systems theory and organizational structure, and provides practical advice on how to conceive, staff, and guide a project management department for maximum effectiveness and cost efficiency.

ISBN/ISSN: 0471225770

**Standards for Engineering Design and Manufacturing (2005)**

Khan, W.A. & Raouf A.

CRC Press <http://www.crcpress.com/>

ISBN/ISSN: 0824758870

**Workflow Modeling: Tools for Process Improvement and Application Development (2001)**

Sharp, A. & McDermott, P.

Artech House Publishers <http://www.artech-house.com/>

Start with the end—the result—in mind.” That is the message driving this visual models approach to improving the work flow process for organizational success.

ISBN/ISSN: 1580530214

## Books (con't)

### Manufacturing

#### **Society of Manufacturing Engineers**

<http://www.sme.org/>

Huge bookstore and numerous technical publications.

#### **Assembly Automation And Product Design, 2e (2005)**

Boothroyd, G. &, Boothroyd, G.

CRC Press <http://www.crcpress.com/>

Reference guide for manufacturing, product, design, industrial, and mechanical engineers seeking to improve productivity and competitiveness while reducing costs.

ISBN/ISSN: 1574446436

#### **Automated Manufacturing Systems Actuators, Controls, Sensors, and Robotics (1995)**

Morriss, S. B.

McGraw-Hill <http://books.mcgraw-hill.com/>

This introductory text, which requires no prerequisites, examines the components used in automated systems.

ISBN/ISSN: 0028023315

#### **Computer-Aided Manufacturing, 3e (2005)**

Chang, T.C., Wysk, R.A. & Wang, H.P.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

A textbook focusing on automation, flexible automation, and CIM. Provides the scientific principles and analytical background for manufacturing planning, control, and design.

ISBN/ISSN: 0131429191

#### **Creating Mixed Model Value Streams: Practical Lean Techniques for Building to Demand (2002)**

Dungun, K.

Productivity Press

Practical lean techniques for building to demand.

ISBN/ISSN: 1563272806

#### **Exploring Manufacturing (2000)**

Wright, R.T.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Introduces middle school students to manufacturing as a technological system that converts materials into products.

ISBN/ISSN: Textbook 1-56637-530-4

ISBN/ISSN: Student Activity Manual 1-56637-531-2

ISBN/ISSN: Instructor's Manual 1-56637-532-0

**Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 2e (2001)**

Groover, M.P.

**Industrial Materials (2001)**

Helsel L., & Liu, P.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Five major types of industrial materials—metals and their alloys, plastics, ceramics, wood and engineered wood products, and composites. Destructive and nondestructive testing of materials also presented in an overview format. Advanced high school level.

ISBN/ISSN: Textbook 1-56637-815-X

ISBN/ISSN: Instructor's Guide 1-56637-816-8

**Industrial Process Control Systems (1997)**

Patrick, D.R. & Fardo, S. W.

Thomson Delmar Learning <http://www.delmarlearning.com/>

A systems approach of the process control in industry. Covers computer integrated manufacturing and flexible manufacturing systems. Coverage of microprocessors includes topics such as PLCs, robotics, and computer controlled systems.

ISBN/ISSN: 0827363869

**Introduction to Manufacturing Processes, 3e (2000)**

Schey, J, A.

McGraw-Hill <http://books.mcgraw-hill.com/>

Physical principles and the application of these principles to processes. The major difference relative to the second edition will be the emphasis on interactions between process and design.

ISBN/ISSN: 0070311366

**Introduction to Materials and Processes (1996)**

Wright, J. R. & Helsel, L. D.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Introduces the beginning student of engineering to the basic concepts of the industrial materials and manufacturing processes.

ISBN/ISSN: 0827350201

**Lean Distribution : Applying Lean Manufacturing to Distribution, Logistics, and Supply Chain (2005)**

Zylstra, K.D.

John Wiley <http://www.wiley.com/WileyCDA/>

Shows how lean distribution practices simplify the distribution process and can generate big savings in costs.

ISBN/ISSN: 0471740756

**Lean Thinking (1996)**

Womack, J.P. & Jones, D. T.

Simon and Schuster <http://www.simonandschuster.com/>

Recommended as the best introductory book on the subject of Lean Manufacturing.

ISBN/ISSN: 0684810352

### **Manufacturing and Automation Technology (2004)**

Wright, R.T.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

For beginning classes, text covers manufacturing processes and management technology as they relate to the Standards for Technological Literacy.

ISBN/ISSN: Textbook 1-59070-212-3

ISBN/ISSN: Student Activity Manual 1-59070-213-1

ISBN/ISSN: Teacher's Resource CD 1-59070-214-X

### **Manufacturing Planning and Control for Supply Chain Management, 5e (2005)**

Vollmann, T.E., Berry, W.L., Whybark, D.C. & Jacobs, F. R.

McGraw-Hill <http://books.mcgraw-hill.com/>

Comprehensive real world based coverage of the concepts, tools, and methods used to manage and control manufacturing systems.

ISBN/ISSN:

### **Manufacturing Process Controls for the Industries of the Future (1998)**

by National Research Council (Corporate Author)

National Academies Press <http://www.nap.edu/>

ISBN/ISSN: 0309061849

### **Manufacturing Processes & Materials, 4e (2000)**

Schrader G.F.

New edition of a text that provides the necessary foundation knowledge for plant-floor personnel in technical departments of Society of Manufacturing Engineers.

ISBN/ISSN: 0872635171

### **Manufacturing Processes for Technology, 2e (2000)**

Fellers, W.O. & Hunt, W.H.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)An elementary textbook for students of manufacturing engineering or technology. Surveys the principal processes by which raw materials become finished products, including removing or adding material, changing the form or condition, joining, and finishing,

ISBN/ISSN: 0130177911

### **Manufacturing Strategy: How to Formulate and Implement a Winning Plan, 2e (2005)**

Miltenburg, J.

Productivity Press Inc <http://www.productivityinc.com/>

Simple yet sophisticated method for planning and implementing the most appropriate production system for any company. The objective being to provide the highest possible levels of outputs a market wants most—quality, cost, delivery, flexibility, innovation, and performance.

ISBN/ISSN: 1563273179

### **Manufacturing Systems (2000)**

Wright, R.T.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

High school text discusses the basic elements of the manufacturing enterprise as a system, or managed body of activities. Complementary roles of management and labor are covered.

ISBN/ISSN: Textbook 1-56637-584-3

ISBN/ISSN: Student Activity Manual 1-56637-585-1

ISBN/ISSN: Instructor's Manual 1-56637-586-X

### **Manufacturing Systems : Theory and Practice, 2e (2005)**

Chryssolouris, G.

Springer <http://www.springerlink.com/>

This text, developed at MIT's laboratory for Manufacturing and Productivity, provides an overview of manufacturing from the ground up. After a discussion of the technological and economic aspects of manufacturing, the book delves into the fundamental building blocks of manufacturing systems: equipment and processes.

ISBN/ISSN: 0387256830

### **Mastering CAD/CAM (2005)**

Zeid, I.

McGraw-Hill <http://books.mcgraw-hill.com/>

Comprehensive assembly of modern topics, including feature-based modeling, parametrics, NURBS, collaborative design, PDM, and PLM.

ISBN/ISSN: 0072976810

### **Materials and Processes in Manufacturing, 9e (2003)**

E. Paul DeGarmo, J. T. Black, Ronald A. Kohser

Jossey Bass <http://www.josseybass.com/>

Provides a descriptive introduction to manufacturing processes, materials, and manufacturing systems. Includes numerous illustrations, photographs, and diagrams throughout the text.

ISBN/ISSN: 0-471-03306-5

### **Materials Science in Manufacturing (2005)**

Asthana, R., Kumar, A. & Dahotre, N.B.

Butterworth-Heinemann elsevier <http://books.elsevier.com/>

Focuses on materials science and materials processing primarily for engineering and technology students preparing for careers in manufacturing.

ISBN/ISSN: 0750677163

### **Maximizing Your ERP System A Practical Guide for Managers (2003)**

Hamilton, S.

McGraw-Hill <http://books.mcgraw-hill.com/>

Provides practical guidance for managing manufacturing. Illustrated with case studies from the author's firsthand experience in consulting to more than 1,000 firms,

ISBN/ISSN: 0071406115

**OM Video Series Top 10 DVD (2003)**

MacLean, B.

McGraw-Hill <http://books.mcgraw-hill.com/>

Manufacturing Processes; Computer Integrated Manufacturing: Nucor; Scheduling: Washburn Guitar; Scheduling Services: United Airlines; JIT: Federal Signal; International Logistics: APL; Project Management: The Alton Bridge; Managing Inventory; A Day in the Life of Quality: Honda; JIT McDonald's Style

ISBN/ISSN: 0072917776

**Operations Management for Competitive Advantage, 11e (2006)**

Chase, R.B., Jacobs, F.R. & Aquilano, N. J

McGraw-Hill <http://books.mcgraw-hill.com/>

A current and thorough introduction to the concepts, processes, and methods of managing and controlling operations in manufacturing or service settings.

ISBN/ISSN: 0073121665

**Problem-Based Learning Print: Manufacturing Tech (1998)**

Thomson Delmar Learning <http://www.delmarlearning.com/>

Each of the ten print units is designed to correspond to one of the ten career clusters. Each is built around a real-world problem that workers in that industry face.

ISBN/ISSN: 1889726273

**Processes of Manufacturing (2005)**

Wright, R.T.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Various methods of processing metals, plastics, ceramics, and composite materials. Major processes used in manufacturing today: casting and molding, forming, separating, conditioning, assembling, and finishing.

ISBN/ISSN: Textbook 1-59070-362-6

ISBN/ISSN: Instructor's Guide 1-59070-363-4

**Product Design and Development, 3e (2004)**

Ulrich, K. & Eppinger, S.

McGraw-Hill <http://books.mcgraw-hill.com/>

Brings together the marketing, design, and manufacturing functions of the enterprise.

ISBN/ISSN: 0072471468

**Production Planning and Controlling (1998)**

Minty, G.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Resource management using a practical problem-based approach. Includes resources and procedures needed for production, planning for production, and controlling production and inventory. Three case studies are used throughout the text.

ISBN/ISSN: Textbook 1-56637-449-9

ISBN/ISSN: Instructor's Guide 1-56637-450-2

ISBN/ISSN: PowerPoint Presentations 1-56637-499-5

**Ramblewood Manufacturing (2000)**

Mansuetti, L. & Weidkamp, K.

McGraw-Hill <http://books.mcgraw-hill.com/>

This computerized practice set provides students with a full corporation simulation intended for use after coverage of job-order cost accounting using a JIT inventory system. Approximate completion time is 10-14 hours. Windows 0256221383

ISBN/ISSN: CD-ROM Student Package 0072348151

**Rapid Manufacturing Technologies (2006)**

Hopkinson, N.

Halsted Press

ISBN/ISSN: 0470016132

**Robotics Technology (1996)**

James Masterson, J., Towers, R. & Fardo, S. W.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Comprehensive approach to presenting the technical aspects of robotics. Basic principles of industrial robotics, power supplies and movement systems, sensing and end-of-arm tooling, and control systems.

ISBN/ISSN: Textbook 1-56637-046-9

ISBN/ISSN: Laboratory Manual 1-56637-176-7

ISBN/ISSN: Instructor's Guide 1-56637-047-7

**The Small Manufacturer's Toolkit: A Guide To Selecting The (2005)**

Novak, S.

Auerbach Publications <http://www.auerbach-publications.com/home.asp>

ISBN/ISSN: 0849328837

**The Toyota Way (2004)**

Liker, J.

McGraw-Hill <http://books.mcgraw-hill.com/>

Book for a general audience that explains the management principles and business philosophy behind Toyota's worldwide reputation for quality and reliability.

ISBN/ISSN: 0071392319

**Why ERP? A Primer on SAP Implementation (2001)**

Jacobs, F. R. & Whybark, D.C.

McGraw-Hill <http://books.mcgraw-hill.com/>

A short novel about a manager in a furniture manufacturing business who is charged with learning about and implementing a new ERP system, SAP R/3.

ISBN/ISSN: 0072400897

## **Books (con't)**

### **Mathematics and Measurement**

#### **Practical Problems in Mathematics for Manufacturing (2006)**

Davis, D.D.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Supply the basic mathematical skills and applications encountered in the workplace by manufacturing technicians.

ISBN/ISSN: 1401836631

## Books (con't)

### Metals

#### **Applied Manufacturing Process Planning: With Emphasis on Metal Forming and Machining (2000)**

Nelson, D.H. & Schneider, G.

Prentice Hall <http://phcatalog.pearson.com/>

[subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812) Chapters are organized in the sequence used to develop manufacturing plans in actual practice.

ISBN/ISSN: 0135324580

#### **Audel Automated Machines and Toolmaking, 5e (2004)**

Miller, R. & Miller, M.R.

Jossey Bass <http://www.josseybass.com/>

Whether you're a professional machinist, an apprentice, or a trade student, this fully illustrated volume helps you work with metal—safely, precisely, efficiently—using today's tools and techniques.

ISBN/ISSN: 0764555286

#### **Audel Machine Shop Basics, 5e (2004)**

Miller, R. & Miller, M.R.

Jossey Bass <http://www.josseybass.com/>

Includes new machines and electronic/digital controls, is the ultimate guide to basic machine shop equipment and how to use it.

ISBN/ISSN: 076455526X

#### **CNC, A First Look Primer (1997)**

Luggen, W.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Beginner's introduction to computer numerical control. It offers solid instruction in the fundamentals of this highly skill-oriented technology.

ISBN/ISSN: ISBN/ISSN: 0827372450

#### **CNC Programming Principles and Applications (2002)**

Mattson, M.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Sets machinists and machine operators on a systematic path to mastering G- and M-code programming, guiding them from initial planning through programming of an actual NC machining job.

ISBN/ISSN: 0766818888

#### **Computer Numerical Control, Concepts & Programming (2002)**

Seames, W.

Thomson Delmar Learning <http://www.delmarlearning.com/>

CNC programming book provides with foundation in programming codes and syntax.

ISBN/ISSN: 0766822907

### **Dimensioning and Tolerancing Handbook**

Drake, P.J.

McGraw-Hill <http://books.mcgraw-hill.com/>

It is a “one-step” resource for people who want to know everything about dimensional management and variation management. It is a useful reference for specific target audiences within the variation management process.

ISBN/ISSN: 0070181314

### **Exploring Metalworking (2003)**

Walker, J.R.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Instruction in using both hand and power tools. Projects are included.

ISBN/ISSN: Textbook 1-56637-992-X

ISBN/ISSN: Workbook 1-56637-993-8

ISBN/ISSN: Instructor’s Guide 1-56637-994-6

### **Introduction to Computer Numerical Control, 3e (2003)**

Valentino

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

Over 92 completely solved programming examples in word.

ISBN/ISSN: Student Edition 0130944246

ISBN/ISSN: Instructor’s Manual 0130497169

### **Machine Tool And Manufacturing Technology (1998)**

Steve Krar; Mario Rapisarda; Albert F. Check

Thomson Delmar Learning <http://www.delmarlearning.com/>

The basic machine tool operations are covered with a complete section on CNC programming and operation for teaching-size and standard machines.

ISBN/ISSN: 0827363516

ISBN/ISSN: Workbook 0-8273-7587-5

### **Machinery’s Handbook 27th Edition (2004)**

Erik Oberg, E., Jones, F. D., Horton, H.L. & Ryffel, H.H.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Reference book has been the authoritative source of metalworking information for more than 86 years.

ISBN/ISSN: Textbook 7007Z

### **Machining and CNC Technology (2005)**

Fitzpatrick, M.

McGraw-Hill <http://books.mcgraw-hill.com/>

The text is written for introductory courses, and does not assume previous machining background on the part of readers. Part I discus

ISBN/ISSN: 0078298601

### **Machining Fundamentals (2004)**

Walker, J.R.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Introduction to the various machining operations, setups, and procedures. Extensive coverage of CNC and automated manufacturing processes.

ISBN/ISSN: Textbook 1-59070-249-2

ISBN/ISSN: Workbook 1-59070-250-6

ISBN/ISSN: Instructor's Manual 1-59070-251-4

ISBN/ISSN: Instructor's Resource Binder 1-59070-297-2

ISBN/ISSN: Instructor's Resource CD 1-59070-252-2

### **Metal Projects, Book 2 (no date)**

Fifer, B.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Presents many outstanding projects for metalworking areas including sheet metal, foundry, welding, and forging.

ISBN/ISSN: Textbook 1-087006-172-0

### **Metallurgy Fundamentals (2005)**

Daniel A. Brandt, D.A. & Warner, J.C.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Basic properties, characteristics, and production of the major metal families.

ISBN/ISSN: Textbook 1-59070-345-6

ISBN/ISSN: Instructor's Manual 1-59070-346-4

### **Modern Metalworking 2004 Edition (2004)**

Walker, J.R.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Basic information about tools, materials, and procedures used in metalworking. Covers hand and machine-tool operations.

ISBN/ISSN: Textbook 1-59070-224-7

ISBN/ISSN: Workbook 1-59070-225-5

ISBN/ISSN: Instructor's Manual 1-59070-226-3

### **Shop Reference: for Students and Apprentices (2001)**

Hoffman, E.G.

Designed for students preparing for jobs in metalworking industries, many applications of shop mathematics and other practical aspects of the machine trades.

ISBN/ISSN: Textbook 0792Z

### **Technology of Machine Tools, 6e (2005)**

Krar, S.F., Gill, A.R. & Smid, P.

McGraw-Hill <http://books.mcgraw-hill.com/>

State-of-the-art training for using machine tools in manufacturing technology, including up-to-date coverage of computer numerical control. Text:0078307228

ISBN/ISSN: Student Workbook: 0078307244

## Books (con't)

### Plastics

#### **Society of Plastics Engineers**

<http://www.4spe.org/training/products/process.php>

Huge list of books, videos, CDs, etc.

#### **Adhesion and Adhesives Technology: An Introduction, 2e (2002)**

Pocius, A.V.

Hanser Gardner Publications <http://www.hansergardner.com/>

This book describes the three main disciplines that make up adhesion technology: mechanics of the adhesive bond, chemistry of adhesives, and surface science.

ISBN/ISSN: 1-56990-319-0

#### **Blow Molding Handbook: Technology, Performance, Markets, Economics: The Complete Blow Molding Operation (2003)**

Rosato, D.V., Rosato, D.V. & Di Mattia, D.P. (Eds),

Hanser Gardner Publications <http://www.hansergardner.com/>

Written for fabricators, designers, and engineers, and providing enough background for the beginner, this handbook provides a review of the blow molding (BM) process that includes both practical and theoretical, and elementary and advanced information.

ISBN/ISSN: 1569903433

#### **Coloring of Plastics, 2e (2006)**

Charvat, John Wiley <http://www.wiley.com/WileyCDA/>

Issues of color science, measurement, materials science, product testing, government regulations, and recycling are covered.

John Wiley & Sons

ISBN/ISSN: 0471139076

#### **Designing Plastic Parts for Assembly, 5e (2003)**

Tres, P. A.

Hanser Gardner Publications <http://www.hansergardner.com/>

Whether the reader is just entering the field or is a seasoned plastic parts designer, an excellent tool that will facilitate cost effective design decisions and help to ensure that the plastic parts and products designed stand up under use.

ISBN/ISSN: 1-56990-350-6

#### **Handbook of Plastic Processes (2006)**

by Harper

John Wiley <http://www.wiley.com/WileyCDA/>

ISBN/ISSN: 0471662550

**Handbook of Plastics Testing and Failure Analysis (2006)**

Shah

John Wiley <http://www.wiley.com/WileyCDA/>

John Wiley & Sons

ISBN/ISSN: 0471671894

**How to Make Injection Molds (2001)**

Menges, G., Michaeli, M. & Mohren, P.

Hanser Gardner Publications <http://www.hansergardner.com/>

This guide for professionals in the plastics processing industry describes the making of injection molds from a practical and theoretical point of view.

ISBN/ISSN: 1569902828

**Industrial Plastics, 4e (2004)**

Lokensgard, E.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Current technologies and manufacturing methods are the keystone for this introduction to all facets of the plastics industry, Augmented by practical lab activities that build on the topics covered in the chapters, involving students in hands-on learning.

ISBN/ISSN: 1401804691

**Injection Molding Handbook (2001)**

Paul Gramann, P., Osswald, T.A. & Turng, T.

Hanser Gardner Publications <http://www.hansergardner.com/>

This new book serves as an introductory textbook for students getting acquainted with injection molding.

ISBN/ISSN: 1-56990-318-2

**Joining of Plastics: Handbook for Designers and Engineers, 2e (2004)**

Rotheiser, J.I.

Hanser Gardner Publications <http://www.hansergardner.com/>

A “how-to” book, offering a wealth of hard-to-find detailed information.

ISBN/ISSN: 1-56990-354-9

**Modern Plastics Handbook (2004)**

Harper, C.A.

McGraw-Hill Professional <http://books.mcgraw-hill.com/>

State-of-the-art guide to plastic product design, manufacture and application. Sponsored by Modern Plastics, a trade magazine. This A-to-Z guide covers most topics.

ISBN/ISSN: 0070267146

**Plastics and Coatings: Durability, Stabilization, and Testing (2001)**

Ryntz, R (Ed.)

Hanser Gardner Publications <http://www.hansergardner.com/>

Comprehensive overview of the durability of coatings and plastics, including information on their chemical, photooxidation, moisture, heat, and solvent resistance.

ISBN/ISSN: 1-56990-290-9

**Plastics Extrusion Technology, 2e (1997)**

Hensen, F. (Ed.)

Hanser Gardner Publications <http://www.hansergardner.com/>

A broad reference on the processes and aspects of extrusion technology, including the design, construction, and operation of extrusion lines.; 2nd edition (September 1, 1997)

ISBN/ISSN: 1569902259

**Plastic Injection Molding : Manufacturing Process Fundamentals (1999) (Fundamentals of Injection Molding Series)**

Bryce, D.M.

Society of Manufacturing Engineers <http://www.sme.org/>

ISBN/ISSN: 0872634728

Plastic Injection Molding: Product Design & Material Selection Fundamentals (1997) (Fundamentals of Injection Molding Series)

Bryce, D.M.

Society of Manufacturing Engineers <http://www.sme.org/>

The second book in the injection molding series addresses the basics and the fine points of plastic materials and product design phases of the thermoplastic injection molding process.

ISBN/ISSN: 0872634884

**Plastics Materials and Processes (2003)**

Harper, C.A. & Petrie, E.M.

Wiley & Sons, Interscience <http://www3.interscience.wiley.com/cgi-bin/home>

Arranged in alphabetical order, it clearly explains all of the materials and processes as well as their major application areas and usages.

ISBN/ISSN: 0471456039

**Plastics Packaging: Properties, Processing, Applications, and Regulations, 2e (2004)**

Selke, S.M., Culter, J.D. & Hernandez, R.J.

Hanser Gardner Publications <http://www.hansergardner.com/>

Provides a basic understanding of plastic packaging materials. It covers the properties of common packaging plastics, and relates these properties to the chemical structure of the polymers. Common processing methods for transforming plastic resins into packages are covered.

ISBN/ISSN: 1-56990-372-7

**Plastics Processing: An Introduction (1995)**

Michaeli, W. Published: 1995

Hanser Gardner Publications <http://www.hansergardner.com/>

This overview of the essential methods of plastics processing includes basic principles, theory, and technical background information.

ISBN/ISSN: 1-56990-144-9

**Practical Extrusion Blow Molding (Plastics Engineering**

Belcher, S. L. (Ed.)

Marcel Dekker <http://www.dekker.com/index.jsp>

Single-source reference for training and on-the-job guidance in perhaps the most common method of shaping plastic.

ISBN/ISSN: 0824719972

**Simple Methods for Identification Of Plastics, 4e (1999)**

Braun, D.

Hanser Gardner Publications <http://www.hansergardner.com/>

This concise guide enables processors and users to determine the chemical nature and classification of unknown plastic materials.

ISBN/ISSN: 1-56990-280-1

**Training in Injection Molding, 2e (2001)**

Walter Michaeli, W., Helmut GreifH., Kretzschmar, G. Ehrig, F.

Hanser Gardner Publications <http://www.hansergardner.com/>

This text and workbook provides a clearly written, comprehensive introduction to the major topics associated with injection molding.

ISBN/ISSN: 1-56990-302-6

**Training in Plastics Technology, 2e (2000)**

Walter Michaeli, W., Wolters, L., Greif, H. & Vossebürger, F.J.

Hanser Gardner Publications <http://www.hansergardner.com/>

This comprehensive best-selling reference provides the fundamental information you'll need to understand both the processing and applications

ISBN/ISSN: 1-56990-293-3

**Understanding Blow Molding (Hanser Understanding Books) (2001)**

Lee, N.C.

Hanser Gardner Publications <http://www.hansergardner.com/>

A general introduction to the basics of plastic blow molding, the process by which a plastic shell can be expanded by air and heat to take the form of its mold, such as a milk jug. Extrusion and injection processes are covered

ISBN/ISSN: 1569903018

**Understanding Extrusion (Hanser Understanding Books) (1998)**

Rauwendaal, C.

Hanser Gardner Publications <http://www.hansergardner.com/>

This book presents basic information on extrusion and is accessible to professionals without an engineering degree.

ISBN/ISSN: 1-56990-233-X

**Understanding Injection Molding Technology (Hanser Understanding Books) (1995)**

Rees, H.

Hanser Gardner Publications <http://www.hansergardner.com/>

This introduction emphasizes the basic technical information specific to injection molding and the various technical problems faced when working in industry.

ISBN/ISSN: 1-56990-130-9

**Understanding Plastics Testing (Hanser Understanding Books) (2004)**

Hylton, D.C.

Hanser Gardner Publications <http://www.hansergardner.com/>

Use this brand new quick reference guide to get an overview on plastics testing.

ISBN/ISSN: 1-56990-366-2

**Understanding Product Design Injection Molding (Hanser Understanding Books) (1996)**

Rees, H.

Hanser Gardner Publications <http://www.hansergardner.com/>

This book offers assistance on selecting the proper material for any product and determining whether injection molding is the process best suited for the application.

ISBN/ISSN: 1-56990-210-0

## Books (con't)

### Prints and Documents

#### **Basic Technical Drawing, 7e, (2000)**

This classic textbook provides a solid foundation in manual, or board drafting.

McGraw-Hill <http://books.mcgraw-hill.com/>

ISBN/ISSN: 0026825538

#### **Drafting for Industry (1995)**

Clois E. Kicklighter, C.E. & Brown, W.C.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Covers drafting fundamentals and advanced drafting and design techniques. Instrument drafting and computer aided design.

ISBN/ISSN: Textbook 1-56637-048-5

ISBN/ISSN: Worksheets 1-56637-049-3

ISBN/ISSN: Instructor's Manual 1-56637-050-7

#### **Engineering Drawing and Design (3<sup>rd</sup> Ed.)**

David A. Madsen

Genium Group <http://www.dz.genium.com/>

or Thomson Learning Delmar Publishers <http://e-catalog.thomsonlearning.com>

Increased emphasis on visualization, the design process, and modern CAD technology. Approach to drafting is consistent with the National Standards Institute (NSI) and the American Society of Mechanical Engineers (ASME).

ISBN/ISSN: 0-7668-1634-6

#### **Geometric Dimensioning and Tolerancing (2003)**

Madsen, D.A.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Covers fundamentals of GD&T concepts, how to read and interpret prints and symbols, and teaches how to draw using GD&T symbology..

ISBN/ISSN: Textbook 1-56637-977-6

ISBN/ISSN: Instructor's Guide 1-56637-978-4

#### **How To Write & Present Technical Information, 3e (1998)**

**Sides, C.H.**

Harcourt Brace Greenwood <http://www.greenwood.com/>

ISBN/ISSN: 1-57356-133-9

#### **Introduction to Graphics Communications for Engineers (B.E.S.T. Series) (2<sup>nd</sup> Ed.) (2002)**

Bertoline, Gary Robert

McGraw Hill Engineering <http://mcgrawhillengineeringcs.com/mhhe/catalog>

A short introductory technical drawing text intended for use in technical drawing or drafting courses at two and four year schools or other technology programs.

ISBN/ISSN: 0-0724-3634-4

### **Machine Trades Print Reading (2001)**

Michael A. Barsmian, M.A. & Gizelbach, R.A.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Designed to help students develop the basic skills required for visualizing and interpreting industrial prints.

ISBN/ISSN: Textbook 1-56637-594-0.

ISBN/ISSN: Instructor's Manual 1-56637-595-9

### **Print Reading for Industry (2002)**

Brown, W.C., & Brown, R.K.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Designed to assist students in reading and understanding industrial prints. Suitable for high school technical/vocational classes, industrial training programs, and community college drafting/print reading curriculums.

ISBN/ISSN: Textbook 1-56637-807-9

ISBN/ISSN: Instructor's Guide 1-56637-808-7

### **Successful Technical Writing (2000)**

Brown, B. W.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Includes samples and techniques for the many types of tasks performed by technical writers today, from letters and memos to detailed operation or maintenance manuals to grant proposals to research reports and accident and safety documents.

ISBN/ISSN: Textbook 1-56637-696-3

ISBN/ISSN: Instructor's Guide 1-56637-697-1

## Books (con't)

### Quality

#### **Gemba Kaizen: A Commonsense, Low-Cost Approach to Management (1997)**

Imai, M.

McGraw-Hill <http://books.mcgraw-hill.com/>

In this sequel to his popular business/quality management book, *Kaizen: The Key to Japan's Competitive Success* (1986), Imai offers a step forward in continuous improvement (kaizen) applied to the concept of continuous improvement in the workplace (gemba).

ISBN/ISSN: 0070314462

#### **ISO 9000, Manufacturing, Software, & Service (1996)**

Charles A. Schuler; Jesse Dunlap; Katherine L. Schuler

Thomson Delmar Learning <http://www.delmarlearning.com/>

This book addresses the relationship of the standards to other quality movements such as total quality management, materials and resource planning at a key point in time. Examples and sample forms are included.

ISBN/ISSN: 0827371241

#### **Implementing Six Sigma: Smarter Solutions Using Statistical Methods, 2e (2003)**

Breyfogle III, F.W.

John Wiley <http://www.wiley.com/WileyCDA/>

ISBN/ISSN: 0471265721

#### **Total Quality Management (1997)**

Richardson, T.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Written in plain language, this text discusses how to tailor TQM to fit the specific needs of organizations of all types and sizes.

ISBN/ISSN: 0827371926

## Books (con't)

### **Software Applications**

#### **AutoCAD® 2006: A Problem Solving Approach (2005)**

Tickoo, S.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Comprehensive resource containing detailed explanations of AutoCAD 2006 commands that enables both basic and advanced users to take maximum advantage of Autodesk®'s newest and most primary software features.

ISBN/ISSN: 1418020419

#### **AutoCAD and its applications Basics 2006 (2006)**

Madsen, D.A. & Shumaker, T.M.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Instruction for mastering AutoCAD commands, tools, and drawing and dimensioning techniques.

ISBN/ISSN: Textbook with Student CD 1-59070-604-8

ISBN/ISSN: Instructor's CD 1-59070-605-6

ISBN/ISSN: Bundle, 180-Day License 1-59070-606-4

ISBN/ISSN: Bundle, One-Year License 1-59070-607-2

#### **AutoCAD and its applications Basics 2005, bundled with AutoCAD Student Software (2005)**

Madsen, D.A. & Shumaker, T.M.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Bundled for either a 180-day or one-year learning license for AutoCAD,

ISBN/ISSN: Textbook 1-59070-392-8

ISBN/ISSN: Textbook 1-59070-393-6

#### **Autodesk Inventor® 10 Essentials Plus (2005)**

Daniel T. Banach, D. T., Jones, T. & Kalameja, A.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Highlights include step-by-step tutorials that showcase practical skills and generous exercises designed for self-paced learning or for use in group-based instruction.

ISBN/ISSN: 1418016985

#### **Autodesk VIZ in Manufacturing Design, Autodesk VIZ/3ds max for Engineering and Technology (2003)**

Duff, J.M.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Autodesk VIZ in Manufacturing Design stresses parallels between VIZ/MAX modeling techniques and modern manufacturing processes. Ideal for novices.

ISBN/ISSN: 1401884202

**Introducing AutoCAD® 2006 (2006)**

Stellman, T. & Krishnan, G.V.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Written specifically for first-time users of AutoCAD®,

ISBN/ISSN: 1418020338

**Learning Mechanical Desktop 2004: A Process-Based Approach (2004)**

Short, T. & Dudek, A.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

**Process-based text that presents MDT commands, options, and techniques where they naturally fit in the design process of real-world products.**

ISBN/ISSN: Textbook 1-59070-308-1

ISBN/ISSN: Instructor's CD 1-59070-309-X

**Learning Inventor 9, bundled with Inventor 9 Student Software (2005)**

Short, T., Dudek, A. & Kramer, B.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Offers a bundle with 180-Day or One-Year Learning License.

ISBN/ISSN: Textbook 1-59070-434-7

ISBN/ISSN: Textbook 1-59070-435-5

**Maximizing Autodesk® Mechanical Desktop® 2005**

Cheng, R.K.C.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Uncovers the secrets of applying the latest version of the software to construct 3D parametric solid parts, generate assemblies, produce 3D NURBS-based surface models, and output 2D engineering drawings, while fostering a familiarity with the utilities provided.

ISBN/ISSN: 1401896871

**Pro/Engineer Solutions & Plastics Design (1999)**

Ladouceur, N. & McKeen, J.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Guides readers through practical examples of plastic components modeling, teaching robust modeling techniques and providing “inside” tips to delivering a manufacturable design. Uses a series of exercises and tutorials.

ISBN/ISSN: 156690188X

**Technical Analysis and Applications with MATLAB (2005)**

Stanley, W.D.

Thomson Delmar Learning <http://www.delmarlearning.com/>

This text combines technical and engineering mathematical concepts at a basic level using MATLAB® for support and analysis.

ISBN/ISSN: 1401864813

**The AutoCAD® 2006 Tutor for Engineering Graphics (2005)**

Alan J. Kalameja, A.J.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Self-paced tutorials take readers all the way from one-view engineering drawings to geometric constructions, multi-view projections, section and auxiliary views, 3D solid modeling, etc.

ISBN/ISSN: 1418020478

## Books (con't)

### **Systems: Electrical/Electronic**

#### **Digital Electronics, 1/e (2006)**

Kleitz, W.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

begins with the basic logic gates used to perform arithmetic operations, and proceeds up through sequential logic and memory circuits used to interface to modern PCs.

#### **Electronics: A Complete Course, 2/e (2004)**

Cook, N.P.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

A complete comprehensive source to teaching electronics.

ISBN/ISSN: Student Edition 0131110667

ISBN/ISSN: Instructor's Resource Manual 0131112309

ISBN/ISSN: TestGen 0131112279

ISBN/ISSN: PowerPoints 0131112287

ISBN/ISSN: Lab Manual 0131135902

#### **Introduction to Electronics: DC/AC Circuits, 1/e (2000)**

Harsany

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

This text provides strong, multi-level coverage of DC circuits, magnetism, and AC circuits, emphasizing practical applications and troubleshooting skills throughout.

ISBN/ISSN: 0133597954

#### **Introductory DC/AC Circuits, 6/e**

Cook, N.P.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

ISBN/ISSN: Student Edition 013114006X

ISBN/ISSN: Lab Manual 0131139916

#### **Introductory DC/AC Electronics, 6/e (2005)**

Cook, N.P.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

ISBN/ISSN: Student Edition 0131139843

ISBN/ISSN: Lab Manual 0131139916

#### **Microchip Fabrication, 5th Ed. (2004)**

Van Zant, P.

McGraw-Hill <http://books.mcgraw-hill.com/>

Standard text used in high school and college classes for semiconductor fabrication.

ISBN/ISSN: 0071432418

### **Semiconductor Manufacturing Handbook (2005)**

Geng, H.

McGraw-Hill Professional McGraw-Hill <http://books.mcgraw-hill.com/>

A comprehensive reference to the semiconductor manufacturing process and ancillary facilities — from raw material preparation to packaging and testing, applying basics to emerging technologies.

ISBN/ISSN: 0071445595

### **The Science of Electronics (2005)**

Floyd, T.L. & Buchla, D.M.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

Three-Text Series Designed Specifically for the High School Electronic Student cover DC/AC, analog and digital devices.

ISBN/ISSN: DC/AC Student Edition 0130875651

ISBN/ISSN: DC/AC Lab Manual 013087566X

ISBN/ISSN: DC/AC Annotated Teachers Edition 0131141449

ISBN/ISSN: DC/AC TestGen 0130328081

ISBN/ISSN: DC/AC PowerPoint Presentation CD-ROM 0131141422

ISBN/ISSN: Analog Devices Student Edition 0130875406

ISBN/ISSN: Analog Devices Lab Manual 0130875597

ISBN/ISSN: Analog Devices Annotated Teachers Edition 0131141430

ISBN/ISSN: Analog Devices TestGen 0130327964

ISBN/ISSN: Analog Devices PowerPoint Presentation CD-ROM 0131141406

ISBN/ISSN: Digital Student Edition 013087549X

ISBN/ISSN: Digital Lab Manual 0130875589

ISBN/ISSN: Digital Annotated Teacher's Edition 0131141457

ISBN/ISSN: Digital TestGen 0130328022

ISBN/ISSN: Digital PowerPoint Presentation CD-ROM 0131141392

## Books (con't)

### Systems: Mechanical

#### **Handbook of Small Electric Motors (2001)**

Yeadon, W. H. & Yeadon, A.

McGraw-Hill <http://books.mcgraw-hill.com/>

A complete, definitive source for the design, manufacture, application, and testing of small electric motors less than ten horsepower.

ISBN/ISSN: 007072332X

#### **Machine Design (2004)**

Timothy H. Wentzell, T. H.

Thomson Delmar Learning <http://www.delmarlearning.com/>

Electric motors and pneumatic and hydraulic drives.

ISBN/ISSN: 1401805175

### Systems: Power

#### **Introduction to Technology, 3e (2005)**

Product Line: Glencoe/McGraw-Hill Glencoe/McGraw-Hill

McGraw-Hill <http://books.mcgraw-hill.com/>

Nature of Technology - why we study technology and its important concepts; Engineering Design - how technology works including design, problem solving, drafting and modeling; Communication, Biotechnology, Manufacturing, Construction and Transportation.

ISBN/ISSN: Student Text 0078612195

## Books (con't)

### **Employability Skills**

#### **Engineering Ethics (1999)**

Fleddermann, C.B.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=81219990131408259](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=81219990131408259)

#### **Engineering Success, 2e (2002)**

Schiavone, P.

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

Most first year engineering students arrive in college or university without the necessary study and survival skills required to be successful at the university level. Equipped with attitudes, work ethics and strategies that worked well in high school, most are simply unprepared for the freedom university life affords them let alone the challenges of an often rigorous and demanding curriculum.

ISBN/ISSN: 0130418277

#### **The Five Dysfunctions of a Team: A Leadership Fable (2002)**

Lencioni , P. M.

Jossey-Bass

Using a fable about a fictitious Silicon Valley firm, Lencioni reveals the five dysfunctions, which go to the very heart of why teams often struggle (absence of trust, fear of conflict, lack of commitment, avoidance of accountability, and inattention to results).

ISBN/ISSN: 0787960756

## Books (con't)

### Career Planning

#### Career Education Videos

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

From School to Work: Workplace Basics. Video S856 34 minutes, Copyright 1998.

Video shows how SCANS competencies. Illustrates the concept of systems. Explains the basic skills employers look for and explores how students can acquire and practice these workplace basics during their school years.

**Communication: The #1 Job Skill.** Video S728 24 minutes, Copyright 1999.

Teachers students how to handle telephone calls, ask questions, listen actively, and deal with criticism and mistakes.

#### Career Ideas For Teens In Manufacturing (Career Ideas for Teens) (2005)

Reeves, D.K. & Karlitz, G.

Facts on File <http://www.factsonfile.com/>

ISBN/ISSN: 0816052948

#### From School to Work (2004)

J.J. Littrell, J.J., Lorenz, J.H. & Smith, H.T.

Goodheart-Willcox [http://www.g-w.com/products/browse\\_technical.asp](http://www.g-w.com/products/browse_technical.asp)

Emphasizes the skills needed to succeed in school, at work, and on their own.

ISBN/ISSN: Textbook 1-56637-968-7

ISBN/ISSN: Teacher's Annotated Edition 1-56637-969-5

ISBN/ISSN: Student Activity Guide 1-56637-970-9

ISBN/ISSN: Teacher's Resource Guide

ISBN/ISSN: Teacher's Resource Portfolio 1-56637-972-5

ISBN/ISSN: Teacher's Resource CD 1-56637-973-3

ISBN/ISSN: PowerPoint Presentations CD-Individual/Site Licenses

#### Keys to Engineering Success, 1/e (2001)

Tietjen

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

Filled with dynamic vignettes, applications, and examples, this introduction to engineering helps keep students interested and motivated.

ISBN/ISSN: Student Edition 0130304824

#### Keys to Science Success, 1/e (2000)

Katz

**Copyright:** 2000 **Publisher:** Prentice Hall

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

The successful *Keys* approach is applied to the fields of science and technology, helping students sharpen their learning and critical thinking skills.

ISBN/ISSN: Student Edition 0130133051

**Keys to Success in College, Career and Life: How to Achieve Your Goals, 4/e (2003)**

Carter, Bishop, Kravits

Prentice Hall [http://phcatalog.pearson.com/subject\\_area\\_listing.cfm?site\\_id=6&discipline\\_id=812](http://phcatalog.pearson.com/subject_area_listing.cfm?site_id=6&discipline_id=812)

This inspirational and practical book educates students about academic skills and shows them how to be more strategic in applying these skills in life and in work, mastering employability issues.

ISBN/ISSN: Student Edition 0130947652

ISBN/ISSN: Instructor's Manual 0130947679

ISBN/ISSN: PowerPoint on Disk 0130947741

ISBN/ISSN: Computer Test Bank 0130947687

ISBN/ISSN: Transparency Acetates 0130994340

**Vault Guide to the Top Manufacturing Employers (2005)**

Turner, T.N.

Vault, Inc. <http://www.vault.com/>

The guide provides business profiles, hiring and workplace culture information on more than 30 top employers, including Alcoa, General Electric, Honeywell and more.

ISBN/ISSN: 1581313241

**Watch it Made in the USA, 3e (2002)**

Axelrod, K. & Brumberg, B.

Avalon Travel Publishing <http://www.travelmatters.com/>

This guide lists photographs, advice for business and family travelers, helpful itinerary planners, and all the practical information necessary to visit nearly 300 factories and company museums across the U.S.A.

ISBN/ISSN: 1566914310

## Arizona Resources

### **2005 Arizona Manufacturers Directory and Cd-Rom Databases**

<http://www.mnistore.com/products.asp?STATE=AZ>

Companies in this database represent nearly ten percent of the total Arizona workforce. Defense, high technology and aerospace dominate state industry. Learn about the seven Honeywell Aerospace facilities that employ a combined 21,530 or the Raytheon Missile Systems plant in Tucson that employs 9,500. Boeing and Bombardier also make helicopters and jets here. Arizona is home to a major Intel computer chip plant and the headquarters of On Semiconductor, Phelps Dodge and Avnet. 3,849 of these companies are in Maricopa County. ISBN #1-58202-336-0, 511 pages. Published each April.

### **Aerospace, Manufacturing & Information Technology (AMIT)**

<http://www.amit-az.org>

As the central voice for over 800 companies and 15,000 professionals in Southern Arizona's aerospace, manufacturing and information technology sectors, AMIT plays an important role in communicating the needs of high-technology businesses to the government agencies that affect its economic climate. AMIT is also an important conduit for information about beneficial government-funded programs and initiatives through its website, newsletters and direct contact with the organization's staff and leadership.

### **Arizona Association of Industries (AAI)**

340 East Palm Lane

Suite 250

Phoenix, AZ 85004

Phone (602) 252-9415

Fax (602) 253-7137

<http://www.azind.org/>

The Arizona Association of Industries (AAI) is the largest manufacturing/industrial trade association in the state of Arizona. AAI is also the state affiliate to the National Association of Manufacturers. AAI and their member companies work to strengthen the economic, social, environmental and governmental conditions for manufacturing and allied enterprises in the state of Arizona.

### **Arizona Manufacturing Extension Partnership (Arizona MEP)**

<http://www.arizonamep.org/index.html>

Arizona MEP is a non-profit service that is part of a nationwide network of MEP centers, linked together through the Department of Commerce National Institute of Standards and Technology (NIST). Arizona MEP provides high-end training and support services to improve efficiency, eliminate waste, get international certifications and integrate into global supply chains. Time Wise Lean Manufacturing certificate program.

### **Arizona Manufacturing Network (AMN)**

<http://phxaz.wliinc3.com/EconomicDevelopment/ArizonaManufacturingNetwork.htm>

Arizona Manufacturing Network (AMN) (A Program of the Greater Phoenix Chamber of Commerce) was established in September 2001 to provide single source, multiple capability, high capacity processing of precision-machined, fabricated, molded, extruded, or assembled mechanical, electro-mechanical or electronic products or components meeting the specification, cost, and quality needs of original equipment manufacturers (OEMs).

### **Arizona Plastics and Advanced Composites Materials Cluster**

<http://www.azplastics.org/index.html>

Sponsored by the Department of Commerce and leading Arizona industries, this cluster's mission is to promote economic development of the plastics industry. Great site to find industry partners committed to building the Arizona workforce.

### **Arizona Quality Alliance**

<http://www.arizona-excellence.com/>

AQA provides the information and opportunities necessary to help Arizona organizations succeed - both financially and operationally. We provide a cooperative atmosphere for organizations in Arizona to excel in total quality management principles and organizational excellence. AQA addresses the very issues of efficiency, productivity, and effectiveness through workshops, informative meetings, a newsletter, networking opportunities and a free library of over 500 items on quality, including videos.

### **Arizona Society of Professional Engineers (ASPE)**

<http://www.azspe.org/>

Four active chapters state-wide serve the individual needs of professional engineers: *Central* and *Papago Chapters* in the metropolitan Phoenix area; *Southern Chapter* for Tucson and Southern Arizona; and *Western Chapter* for Yuma and surrounding vicinity. Check the Web for chapter meeting information and current events/

### **Arizona State University**

<http://www.east.asu.edu/ctas/mmet/>

The Department of Mechanical and Manufacturing Engineering Technology (MMET) at ASU East campus provides students with the opportunity to apply engineering principles to mechanical and manufacturing processes while learning in state-of-the-art laboratories. This program is for students interested in the design and development of products, solving engineering problems, improving manufacturing processes, or making things better, faster or at a lower cost. Their programs prepare students for professional careers with aeronautical, automotive, electronic, computer and other consumer products companies. Contact Dr. Russ Biekert, Associate Professor of MMET to arrange for him to visit your school and discuss careers in manufacturing and engineering (480-727-1119, or email [russb@ase.ed](mailto:russb@ase.ed)).

### **Arizona State University Women in Applied Science and Engineering (WISE) Program-**

<http://www.eas.asu.edu/~wise/>

Develops programs that support women and serve young female students, their parents, and the community. WISE hosts a variety of programs and events geared toward getting young students interested in science and engineering careers. The WISE-UP Program, support by Intel Corporation is a one-week residential program for high school students interested in ASU and engineering career opportunities.

This program is geared toward entering 10th -12th grades and includes a variety of activities, laboratories, and a weeklong engineering project on robotics.

### **Arizona Tooling and Machining Association**

<http://www.arizonatooling.org/>

Our member companies are engaged in precision custom manufacturing, including contract machining, tool & die making, mold building and building of special purpose machines for all industries. Check website for upcoming chapter events.

### **AVNET**

<http://www.avnet.com/>

Avnet markets, distributes and adds value to a wide variety of electronic components, enterprise computing products and embedded systems. Through its premier market position, Avnet brings a breadth and depth of capabilities that help its trading partners accelerate growth and realize cost efficiencies. Avnet generated more than \$10 billion in revenue in fiscal 2004 through sales in 68 countries. Their motto is “Enabling Success from the Center of Technology”. Avnet’s Director of Integration, John Beimfohr is willing to host a field trip or visit a nearby school. He also would be interested in an internship program for students at least 18 years old to work in cellular assembly lines for Whitebox and Branded computers. Contact John at 480-794-8768, or email him at [john.beimfohr@avnet.com](mailto:john.beimfohr@avnet.com).

### **ChipCamp**

<http://www.east.asu.edu/ctas/STEP/Camp.html>

NSF’s Maricopa Advanced Technology Education Center (MATEC), Intel corporation, and the Arizona High Tech Industry Cluster “School to Work Initiative” offer 60 high school students from both Phoenix & Tucson area schools the opportunity to participant in a three-day overnight camp at Arizona State University, East designed to use fun activities as tool to educate students on technology and careers in the high-tech industry. During the camp, students get opportunities to build robots, participate in robot competitions, build transistors, and spend time in bunny suits at the semiconductor teaching factory on site at Arizona State University, East. For Juniors and Seniors.

### **FIRST**

<http://www.usfirst.org/about/>

FIRST was founded in 1989 by Dean Kamen, inventor of the Segway Human Transporter. FIRST operates the FIRST Robotics Competition in which teams of high school students, sponsored and assisted by local companies and volunteers, design, assemble, and test a robot capable of performing a specified task in competition with other teams. Arizona competitions started in 2004.

### **Institute for Supply Management**

<http://www.ism.ws/>

The largest supply management association in the world as well as one of the most respected. ISM’s mission is to lead the supply management profession through its standards of excellence, research, promotional activities, and education. Professional development opportunities.

### **Intel Tech Ambassador Program**

<http://www.intel.com/community/arizona/education.htm#Development>

e-mail [eugenia.r.echols@intel.com](mailto:eugenia.r.echols@intel.com) or call 480-554-4538.

A program whereby technicians from the manufacturing fab are partnered with each college, as well as feeder high schools, to act as an ambassador on behalf on Intel to both students and faculty. As part of the ambassador program, technicians give resume writing/interviewing workshops, sit on scholarship selection committees, act as guest speakers to classes, partner with the school to help increase enrollments, etc

### **Klein Educational Systems**

<http://www.kleinedu.com/index.html>

Technology curricula and training hardware. Teacher training. Arizona rep is Linda Clark  
[Linda@kleinedu.com](mailto:Linda@kleinedu.com) (480-348-7797).

### **Maricopa Advanced Technology Education Center (MATEC)**

<http://www.matec.org/>

The Center has been established by the National Science Foundation through its Advanced Technology Education program to promote the development of a world class work force in the semiconductor manufacturing and related supporting industries. MATEC acts through its education and industry partners to develop curricula at the community college level, sponsor faculty internships and training programs and encourage enrollment in and awareness of the programs on a national basis.

### **PHASE**

[http://www.ag.arizona.edu/fcs/phase/PHASE\\_ADE\\_Partnership/index.htm](http://www.ag.arizona.edu/fcs/phase/PHASE_ADE_Partnership/index.htm)

The PHASE/ADE Nontraditional Career and Technical Education Program is Arizona's statewide technical assistance program to increase the enrollment and retention of nontraditional career and technical education students, with a focus on secondary and post-secondary schools and colleges. Lots of materials and resources. On-site training.

### **Pima Community College**

<http://www.pima.edu/>

The Electronics and Optical Systems Technology (TEC) Department offers certificates and Associate of Applied Science degrees in Automated Systems Technology including Semiconductor Manufacturing, Electronics Systems Technology, Optical Systems Technology, and Computers and Networking. PCC faculty are available to schools in Tucson and surrounding communities for field trips and guest speakers. Your PCC contact is:

Dr. Lazaro Hong (520) 206-6603 or email: [Lazaro.Hong@pima.edu](mailto:Lazaro.Hong@pima.edu).

### **Proctor and Gamble**

<http://www.pg.com/main.jhtml>

Contact: Jeni Williams, Email:

You know the names: Clairol, Crestä, Pampers, Folgers, Mr. Clean, Cheer, Dawn, Charmin, Iams. But did you know that they are all products of Procter & Gamble? Two billion times a day, P & G brands touch the lives of people around the world. Did you also know that P & G has a plant in Phoenix's West Valley? Jeni Williams, Site Logistics, HR, Warehouse & External Relations Manager can help arrange for someone from P & G to visit your classroom.

## **TRW Vehicle Safety Systems**

<http://www.trwauto.com>

TRW Mesa Operations manufactures driver, passenger, roll-over and side- impact airbags and inflators for automotive customers worldwide and supports a full range of civic, community and educational programs. For field trip or speaker information, contact Joanne Leith, HR Manager at [joanne.leith@trw.com](mailto:joanne.leith@trw.com).

## Websites

### Associations

#### **ABET**

<http://www.abet.org/>

U.S. accreditor of college and university programs in applied science, computing, engineering, and technology. Accreditation ensures the quality of the postsecondary education students receive. Search for accredited colleges.

#### **American Chemical Society (ACS)**

<http://www.chemistry.org/portal/a/c/s/1/home.html>

ACS has developed The Voluntary Industry Standards (VIS) Database for Chemical Process Technicians. These standards are used by the ACS Chemical Technology Program Approval Service (CTPAS) to review, nurture, and approve two-year AAS chemistry-based technology programs. They also have been used as guidelines for the ACS High School program called Science in a Technical World.

#### **American Plastics Council**

[http://www.americanplasticscouncil.org/s\\_apc/index.asp](http://www.americanplasticscouncil.org/s_apc/index.asp)

Strives to ensure plastics are a preferred material by actively demonstrating plastics as a responsible choice in a more environmentally conscious world.

#### **American Society for Quality (ASQ)**

<http://www.asq.org/cert/types/cqt/index.html>

Quality Technician Certification (CQT)

The American Society for Quality (ASQ) creates better workplaces and communities worldwide by advancing learning, quality improvement, and knowledge exchange to improve business results. Provides Quality Technician Certification. Their magazine Quality Progress comes highly recommended <http://www.asq.org/pub/qualityprogress/>.

#### **American Society of Mechanical Engineers (ASME)**

<http://www.asme.org/education/precollege/materials/>

Variety of teaching resources focusing on mechanical engineering

#### **Association for Manufacturing Excellence (AME)**

<http://www.ame.org/main.php>

We are practitioner-based, and our events and workshops focus on hands-on learning. AME publishes the award-winning Target magazine and puts on several regional and national events each year. Online courses and other training materials.

#### **Council of Manufacturing Associations**

[http://www.nam.org/s\\_nam/sec.asp?CID=48&DID=46](http://www.nam.org/s_nam/sec.asp?CID=48&DID=46)

A division of NAM comprising more than 200 trade associations, the mission of the Council of Manufacturing Associations is to help develop legislative, regulatory, economic, and educational opportunities that further the interests and purposes of Council members.

### **Institute of Industrial Engineers (IIE)**

<http://www.iienet.org/>

World's largest professional society dedicated solely to the support of the industrial engineering profession and individuals involved with improving quality and productivity. Student chapters at ASU and UofA. Professional chapter in Phoenix. Conference, seminars and networking.

### **International Society of Certified Electronics Technicians (ISCET)**

<http://www.iscetstore.org/index.html>

Provides Certified Electronics Technician

### **Manufacturing Skills Standards Council (MSSC)**

<http://www.msscusa.org/>

Founded in 1998, the Manufacturing Skills Standards Council (MSSC) is developing a nationwide system of skill standards, assessments and certifications. The MSSC Skill Standards System was released in 2001. Now working with NOCTI to develop certification assessments.

### **National Association of Industrial Technology (NAIT)**

<http://www.nait.org/>

NAIT is responsible for the accreditation of industrial technology programs in colleges, universities, and technical institutes, and the certification of industrial technologists and the recognition of their continued professional development.

### **National Association of Manufacturers (NAM)**

[http://www.nam.org/s\\_nam/index.asp](http://www.nam.org/s_nam/index.asp)

The NAM is the nation's largest industrial trade association, representing small and large manufacturers in every industrial sector and in all 50 states. Headquartered in Washington, D.C., the NAM has 10 additional offices across the country. Site has many national statistics and national agenda for manufacturing in the US.

### **National Coalition for Advanced Manufacturing (NACFAM)**

<http://www.nacfam.org/>

The NACFAM Voluntary Skill Standards for Advanced Manufacturing (1997) preceded the MSSC Skill Standards and were used as guidelines in developing the Career Cluster Resources for Manufacturing (<http://www.careerclusters.org>). They are available for download at <http://www.mfglinks.org/nacfam2.pdf>. NACFAM also is responsible for developing the Computer Aided Drafting and Design (CADD) Skill Standards.

### **National Institute for Certification in Engineering Technologies (NICET)**

<http://www.nicet.org/index.cfm>

NICET's nationally recognized certification programs are designed by industry experts to provide engineering technology fields with a qualified workforce by assessing the candidate's job skills and knowledge.

### **National Institute for Metalworking Skills (NIMS)**

<http://www.nims-skills.org/home/index.htm>

NIMS is a nonprofit organization formed by metalworking trade associations led by the National Tooling and Machining Association (NATMA), national labor organizations, a council of state governors, companies, and educators to support the development of a skilled workforce for the metalworking industry. Through NIMS, Skill Standards and certifications are being written and maintained for four clusters of metalworking occupations.

### **National Society of Black Engineers (NSBE)**

<http://www.nsbe.org/>

### **National Society of Professional Engineers (NSPE)**

<http://www.nspe.org/>

The National Society of Professional Engineers (NSPE) is the only engineering society that represents individual engineering professionals and licensed engineers (PEs) across all disciplines. Promotes engineering licensure and ethics, publishing news of the profession, providing continuing education opportunities, and much more.

### **National Tooling & Machining Association (NTMA)**

<http://www.ntma.org/eweb/StartPage.aspx>

The National Tooling and Machining Association is a trade organization representing the precision custom manufacturing industry throughout the United States.

### **Society of Manufacturing Engineers (SME)**

<http://www.sme.org/>

With an SME membership, you have continuous access to the information and contacts you need to succeed in manufacturing, all in one place. The place “Where Manufacturing Comes Together”. Huge bookstore, technical publications, student zone, events.

### **Society of Plastics Engineers (SPE)**

<http://www.4spe.org/training/products/process.php>

Huge list of books, videos, CDs, etc., Grants, scholarships too.

### **Society of the Plastics Industry (SPI)**

<http://www.plasticsindustry.org/>

Founded in 1937, The Society of the Plastics Industry, Inc. (SPI), is the trade association representing the entire plastics industry supply chain, including processors, machinery and equipment manufacturers and raw materials suppliers. SPI has developed national, voluntary certification examinations that assess and certify the knowledge and skills of plastics operations employees. National Certification in Plastics (<http://www.certifyme.org/>)

### **Society of Professional Hispanic Engineers (SPHE)**

<http://www.shpe.org/>

Student chapters at ASU and NAU. Professional chapters in Greater Phoenix area [http://reg2.shpe.org/shpephx/shpe\\_index.htm](http://reg2.shpe.org/shpephx/shpe_index.htm) and Tucson <http://members.aol.com/shpetucson/>.

## Websites (con't)

### **Career Planning**

#### **ARIZONA CAREER RESOURCE NETWORK**

<http://www.azcis.intocareers.org/loginmain.aspx?ReturnUrl=%2fdefault.aspx&cookieTest=y>

This local site provides multiple resources to implement a career preparation program. Every aspect of the career preparation curriculum is addressed at this website. The information is updated regularly. Each school can receive a password to access teaching strategies and tools.

Contact:

Susan Mellegard, AZCRN Director  
Arizona Career Resource Network  
Arizona Department of Education, CTE  
1535 W. Jefferson St., Bin # 42  
Phoenix, AZ 85007  
Phone (602) 542-5353 Fax (602)-542-1849  
[smelleg@ade.az.gov](mailto:smelleg@ade.az.gov).

#### **ASEE Engineering K12 Center**

<http://www.engineeringk12.org/students/default.htm>

#### **Discover Engineering**

<http://www.discoverengineering.org/home.asp>

Fun site for cool ideas and information about engineering careers.

#### **Dream It, Do It**

<http://www.dreamit-doit.com/>

In order to make manufacturing a preferred career choice by 2010, the NAM Center for Workforce Success is reaching out to young adults, their parents, educators, their communities, and their policy-makers to change their minds about manufacturing's future and its careers. Find career information and media kit.

## Websites (con't)

### Curriculum Resources

#### **BattleBots IQ (BBIQ)**

<http://www.battlebotsiq.org>

BBIQ is an educational program for students from middle school through post secondary. Offers a practical approach to Engineering, Manufacturing and Technology through robotics. Program includes Teacher Training, an On-line Robotics Curriculum, and Competition.

#### **Learning Labs, Inc.**

<http://www.lli.com/index.htm>

Offers a variety of curricula and teacher training in manufacturing and pre-engineering, including Intelitek, Autodest, Techno, Alibre.

#### **National Center for Manufacturing Education (NCME)**

<http://www.ncmeresource.org/>

A must-see site. National Science Foundation site for advanced manufacturing. Complete curriculum for manufacturing technology, professional development opportunities, newsletter, etc.

#### **OnSite/OnLine**

<http://www.ncmeresource.org/onsite/>

Onsite/Online is the hybrid instructional delivery system that allows instructors at any academic institution or industry nationwide to collaborate with Sinclair Community College faculty in providing manufacturing engineering technology courses.

#### **Precision Metalforming Association Educational Foundation (PMAED)**

<http://www.pmaef.org/index.htm>

The PMA Educational Foundation was established in 1996 to help develop a trained, motivated workforce by initiating and supporting training, education and image-building program. Offers curriculum in metalforming, student ambassador program, grants, scholarships, etc.

#### **Project Lead the Way (PLTW)**

<http://www.pltw.org/aindex.htm>

PLTW has developed a four year sequence of courses which, when combined with college preparatory mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. Schools may join the PLTW network and obtain certification for their programs.

#### **South Carolina Advanced Technological Education (SCATE)**

<http://www.scate.org/>

Technology Gateway is designed as a pre-engineering technology preparation. It includes a career exploration module and incorporates mathematics at the introductory and intermediate algebra levels. The Technology Gateway Kit materials include Instructor's Guide Master Copy, spiral bound, 64 pages and student handout materials.

## Websites (con't)

### **Engineering**

#### **Agilent Technologies Educator's site**

[http://www.educatorscorner.com/index.cgi?CONTENT\\_ID=2592](http://www.educatorscorner.com/index.cgi?CONTENT_ID=2592)

A variety of resources for electronics.

#### **Center for Engineering Educational Outreach**

<http://www.ceeo.tufts.edu/>

Situated at Tufts University, this site offers a variety of resources and links for pre-engineering teachers.

#### **Center for Innovation in Engineering and Science Education**

<http://k12science.ati.stevens-tech.edu/>

Situated at the Stevens Institute of Technology, CIESE sponsors and designs interdisciplinary projects that teachers throughout the world can use to enhance their curriculum through compelling use of the Internet. They focus on projects that utilize real time data available from the Internet, and collaborative projects that utilize the Internet's potential to reach peers and experts around the world.

#### **How Stuff Works**

<http://www.howstuffworks.com/>

Briefly explains how all different kinds of things work.

#### **IEEE Pre-College Education**

[http://www.ieee.org/portal/site/mainsite/menuitem.818c0c39e85ef176fb2275875bac26c8/index.jsp?&pName=corp\\_level1&path=education/precollege&file=index.xml&xsl=generic.xsl](http://www.ieee.org/portal/site/mainsite/menuitem.818c0c39e85ef176fb2275875bac26c8/index.jsp?&pName=corp_level1&path=education/precollege&file=index.xml&xsl=generic.xsl)

Resources for students exploring career paths, PEERS programs to encourage collaboration and sharing between engineers and educators, programs, activities, and other materials.

#### **National Engineering Technology Education Clearinghouse (NETEC)** <http://www.neteconline.org>

NETEC serves as a resource center for broad dissemination of exemplary engineering technology education program models, materials, and pedagogical strategies. Primary educational NJCATE partners in the NETEC are the College of DuPage, San Diego City College, St. Louis Community College, and the New Jersey Institute of Technology. Industry and professional association partners include Johnson & Johnson, ITT, PSE&G, IEEE and ABET. Free site with simple registration.

#### **National Engineers Week**

<http://www.eweek.org/index.shtml>

Huge site operates year round for engineer's week; has loads of information and links.

#### **Project Lead the Way (PLTW)**

<http://www.pltw.org/aindex.htm>

PLTW has developed a four year sequence of courses which, when combined with college preparatory mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. Schools may join the PLTW network and obtain certification for their programs.

**South Carolina Advanced Technological Education (SCATE)**

<http://www.scate.org/>

The SC ATE National Resource Center provides this “one-stop shopping” web site for accessing best practices and exemplary materials for recruiting and retaining students, as well as for teaching engineering technology.

## Websites (con't)

### **Journals and Magazines**

#### **Advanced Manufacturing**

<http://www.amazon.com>

#### **American Machinist**

<http://www.freetrademagazinesource.com>

Serves plants in industries primarily engaged in manufacturing durable goods and other metal products. (free)

#### **Control**

<http://www.amazon.com>

Current news on industrial systems control, instrumentation, and automation information relevant to the process automation industries.

#### **Cutting Technology**

<http://www.freetrademagazinesource.com>

Intended to serve as a tutorial tool, helping metalcutting manufacturing personnel improve productivity. (free)

#### **IEE Magazine**

<http://www.iee.org/oncomms/sector/manufacturing/?origin=homepage>

Manufacturing section of the Institute of Electrical Engineers. Membership

#### **Industrial Equipment News**

<http://www.freetrademagazinesource.com>

The latest new product information for U.S. manufacturing and allied industries. (free)

#### **Instrumentation and Automation News**

<http://www.amazon.com>

Product news tabloid that reaches designers, specifiers & users of process & industrial controls, instrumentation & systems.

#### **Manufacturing & Logistics IT Magazine**

<http://www.logisticsit.com/index.aspx>

Free magazine and newsletter with registration.

#### **Manufacturing & Technology News**

<http://www.manufacturingnews.com/>

Twice-per-month publication specializes in original and aggressive journalism. Its readers are on the leading edge of breaking news stories and important trends. Each issue of the publication features interviews with the most respected executives in industry, government, trade associations, professional societies and academia.

### **Manufacturing Engineering**

<http://www.amazon.com>

Articles and news about the engineering aspects of manufacturing, including such topics as the technology of controls, machining, components, tools, coating, dimension specification, and toolholder design, as well as coverage of software and hardware.

### **Manufacturing Worker**

<http://www.amazon.com>

### **Mondo Times Manufacturing Magazines**

<http://www.mondotimes.com/2/topics/5/business/62>

Direct links to dozens of magazines. Most are free.

### **Plastics Technology**

<http://www.plasticstechnology.com/>

Covers all aspects of plastics manufacturing.

### **Power of Plastics**

<http://www.americanplasticscouncil.org>

Published by the American Plastics Council.

### **Quality Progress**

<http://www.asq.org/pub/qualityprogress/>

Offered by the American Society for Quality. Free with membership.

### **Target Magazine**

<http://www.ame.org/template.php?contentFile=targetOnline>

Published by the Association for Manufacturing Excellence.

## Websites (con't)

### **Manufacturing**

#### **AIM Center**

<http://www.aimcenter.org/index.cfm>

Here at the AIM Center, we're all about helping manufacturers find and utilize the necessary resources to improve everything from their assembly line to their bottom line.

#### **Alliance for Innovative Manufacturing (AIM) at Stanford University**

<http://www.stanford.edu/group/AIM/>

Joint venture between multinational corporations with a significant design and manufacturing presence in the United States and Stanford University's Graduate School of Business and School of Engineering. AIM functions as a "Manufacturing Knowledge Broker" to increase the intellectual capital of each of its members.

#### **BattleBots IQ (BBIQ)**

<http://www.battlebotsiq.org/>

BBIQ is an educational program for students from middle school through high school and post secondary educational institutions that is "Changing the Way America Educates". BBIQ uses a three phase approach which includes Teacher Training, an On-line Robotics Curriculum, and Competition. The BBIQ Program offers schools and teachers a practical approach to Engineering, Manufacturing and Technology through robotics. This project is sponsored by the National Tooling and Machining Association.

#### **DeLuca's Techno School**

<http://legacy.ncsu.edu/classes/ted430/intro.html>

Lessons on Introduction to Manufacturing, Manufacturing Systems and Problem solving along with calculators and resources provided by William DeLuca and North Carolina state University.

#### **Discovering Fluid Power: Hydraulics and Pneumatics at Work in Your World**

<http://www.fpef.org/>

Email: [administrator@fpef.org](mailto:administrator@fpef.org)

*A kit of resources to teach basic fluid power concepts to students and novices.* The kit is designed to complement two Pitsco LEGO Dacta™ pneumatic sets. The video covers basic concepts and scientific theory, with real-world examples of applications at work. Additional materials complement the video and promote greater overall interest in the fluid power industry.

#### **Fluid Power Educational Foundation**

<http://www.fpef.org/>

Loads of information and teaching resources for hydraulics and pneumatics, including access to equipment and robotics competitions.

## **GETTECH**

<http://www.gettech.org/default2.asp>

GetTech helps students, teachers, parents to plan for exciting careers in technology, engineering, manufacturing, and science. Sponsored by the National Association for Manufacturing, the Center for Workforce Success, the U.S. Department of Commerce and the U.S Department of Labor.

## **How Everyday Things are Made**

<http://manufacturing.stanford.edu/>

Sponsored by the Alliance for Innovative Manufacturing (AIM) at Stanford University, and Design 4X - a company that develops online courses on design and manufacturing topics. The goal was to teach people about manufacturing in a fun way. Contains over 4 hours of free video detailing how things we use everyday are manufactured. Be sure to follow the link to the online tours of real factories.

## **Kaizen Institute**

<http://www.gembaikaizen.com/home.html>

As the global pioneer of Lean and Continuous Improvement consulting as proposed by M. Imai, the Kaizen Institute offers information and resources for study of Kaizen (improvement) in Gemba (workplace).

## **Lean Manufacturing**

<http://www.continental-design.com/lean-manufacturing/index.html>

Quick lesson and the metrics of lean manufacturing.

## **Lego Robolab**

<http://www.ni.com/company/robolab.htm>

ROBOLAB uses a combination of LEGO bricks and National Instruments LabVIEW graphical development software to introduce engineering concepts to students of all ages - from kindergarten through high school. The ROBOLAB software, jointly developed by National Instruments, Tufts University, and LEGO Dacta, is engineered for the classroom and teaches basic computer programming, robotics, and automation skills. Lots of curriculum, activities, teacher training, conference and student competitions.

## **Machine Tools at MIT**

<http://www-me.mit.edu/Lectures/MachineTools/outline.html>

Documents and video on various prototyping machines

## **Materials Science and Technology (MST) Online**

<http://mst-online.nsu.edu/>

The Materials Science and Technology (MST) online page is sponsored by the NASA (National Aeronautics and Space Administration) Langley Research Center (LaRC) and Norfolk State University (NSU). MST Online provides the user with a wide range of useful educational resources in math, science, engineering, and technology. Annual National Educator's workshop.

**MEL — Manufacturing Engineering Library**  
**NIST National Institute of Standards and Technology**

<http://www.mel.nist.gov/>

Measurements and standards for U.S. manufacturers in mechanical and dimensional metrology and in advanced manufacturing technology. Standards reference materials, free engineering metrology software.

**MERC – Manufacturing Education Resource Center**

<http://nemerresource.org>

The *Engineering Technology Core (ET Core) Instructor Guide* is designed to prepare first-year students for the study of courses specific to an engineering technology major. Also offers free web seminars on topics of interest in manufacturing.

**Manufacturing is Cool**

<http://www.manufacturingiscool.com/cgi-bin/mfgcoolhtml.pl?/home.html&>

Sponsored by the Society of Manufacturing Engineers (SME) to promote the importance of engineering and manufacturing and the interesting, desirable and challenging careers they present. Site provides career information for manufacturing (and other) engineering careers, salary information, accredited schools with manufacturing engineering/technology programs and interesting articles about people in engineering careers. K-12 partners are selected to help spread the word that manufacturing is cool through links to competitions, curricula, special events, and summer fun.

**Manufacturing Institute**

[http://www.nam.org/s\\_nam/sec.asp?TRACKID=&CID=89&DID=87](http://www.nam.org/s_nam/sec.asp?TRACKID=&CID=89&DID=87)

The Manufacturing Institute is the research and education arm of the NAM, building intellectual support and raising understanding among policymakers, the media, educators and potential workers about manufacturing's contributions to the quality of American life, the challenges facing the sector and its excellent, technologically sophisticated career opportunities. The institute was founded in 1991.

**Manufacturing Net**

<http://www.manufacturing.net/>

Lots of industry links.

**Manufacturing Technology Advisory Group (MTAG)**

<http://www.mtag-wa.org/>

MTAG is a Washington state coalition to develop and promote a Manufacturing Technology Education Program that begins in high school and leads to an associate degree at a community or technical college. This "Tech Prep" program is an operational school-to-work strategy designed by and for the manufacturing industry and supports all sectors of that industry. Offers curriculum modules for \$50-75.

**Manufacturing Week Curriculum**

<http://www.manufacturingiscool.com/cgi-bin/mfgcoolhtml.pl?/progs/000252.htm&>

Job Jabber Institute

39318 30th Street

Paw Paw, MI 49079

Phone: (616) 657-2123

Fax: (616) 381-5205

Email: [jobjabber@aol.com](mailto:jobjabber@aol.com)

Students use all their school subjects while they become manufacturing workers. Tasks include product design, development, prototype building, market research, producing communication and sales materials, selling and conducting accounts activities.

### **National Center for Manufacturing Education (NCME)**

<http://www.ncmeresource.org/>

A must-see site. National Science Foundation site for advanced manufacturing. Complete curriculum for manufacturing technology, professional development opportunities, newsletter, etc.

### **Power of Manufacturing Instructional Posters**

<http://www.manufacturingiscool.com/cgi-bin/mfgcoolhtml.pl?/progs/000049.htm&>

Eight posters (free) with instructional materials for classroom use focusing on manufacturing concepts for students.

To order posters: Contact SME customer service by e-mail: [service@sme.org](mailto:service@sme.org) or call 313-271-1500 x4500, and ask for Order # PI-2315E-4000.

### **Probase**

<http://www.probase.ilstu.edu/home.shtml>

Project Probase is funded by the National Science Foundation (NSF) to develop high school level technology education curricula. The Probase curricula will help prepare high school students who plan to go on to community college technician education programs or university-level engineering programs. Offers 11th and 12th grade hands-on problem-solving activities to teach fundamentals of technology in manufacturing.

### **Robolab@CEEEO**

<http://www.ceeo.tufts.edu/robolabatceeo/>

Excellent site for robotics curriculum and activities supported by Tufts University using Lego Robolab.

### **Search Manufacturing**

<http://www.searchmanufacturing.com/>

A huge resource site of just links to all aspects of manufacturing and industrial sites, including books, publications, glossary, etc.

### **SMETE Digital Library**

<http://www.smete.org/smete/>

The SMETE Digital Library is a dynamic online library and portal of services by the SMETE Open Federation for teachers and students. Here you can access teaching and learning materials as well as join this expanding community of science, math, engineering and technology explorers of all ages.

### **Teaching Plastics**

[http://www.teachingplastics.org/9\\_12/index.html](http://www.teachingplastics.org/9_12/index.html)

A variety of resources for teaching grades 9-12.

**What's Up In Factories?**

<http://www.wnet.org/archive/factories/factories4/index.htm>

Contact Person: Mari Cossaboom ([cossaboo@wnet.org](mailto:cossaboo@wnet.org))

This curriculum package consists of a 30-minute educational video that explores the history and value of manufacturing and modern production techniques; a teacher's guide with student worksheets and classroom activities and a poster.

## Websites (con't)

### **Nontraditional Student**

#### **Arizona State University Women in Applied Science and Engineering (WISE) Program-**

<http://www.eas.asu.edu/~wise/>

The WISE program at Arizona State University is dedicated to developing programs and services which improve the climate for and support women in the College of Engineering and Applied Sciences. Currently, WISE offers many programs and services to recruit and retain women within the CEAS and encourage them to pursue academic majors and careers in engineering.

#### **Celebration of Women in Engineering**

National Academy of Engineering (NAE)

<http://www.nae.edu/nae/cwe/cwemain.nsf/>

This project at the NAE brings national attention to the opportunities that engineering represents to all people at any age, but particularly to women and girls. Offers information for parents, teachers and students.

#### **Engineer Girl**

<http://www.engineergirl.org/nae/cwe/egmain.nsf/?Opendatabase>

Sponsored by the National Academy of Engineering, this site offers information to attract young women to engineering careers in a fun, cool way.

#### **National Institute for Women in Trades, Technology and Science**

<http://www.iwitts.com/>

IWITTS provides the tools to successfully integrate women into male-dominated careers via our training, publications, products, e-strategies, and technical assistance. The WomenTech e-Store, a central clearinghouse for products related to integrating women into technology, trade, and law enforcement occupations.

#### **PHASE**

[http://www.ag.arizona.edu/fcs/phase/PHASE\\_ADE\\_Partnership/index.htm](http://www.ag.arizona.edu/fcs/phase/PHASE_ADE_Partnership/index.htm)

The PHASE/ADE Nontraditional Career and Technical Education Program is Arizona's statewide technical assistance program to increase the enrollment and retention of nontraditional career and technical education students, with a focus on secondary and post-secondary schools and colleges. Lots of materials and resources. On-site training.

#### **Society of Women Engineers**

<http://www.SocietyOfWomenEngineers.org/>

See K-12 Section and Region B-Sonora Region

## **STEPS Program**

### **Society of Manufacturing Engineers Education Foundation**

<http://www.sme.org/cgi-bin/smeefhtml.pl?/foundation/youth/steps.html&&&SME&>

Science Technology and Engineering Preview Summer camp for girls (STEPS) is a model program initiated at the University of Wisconsin - Stout and replicated in Minnesota and Michigan. It is a one-week introduction to the world of technology and engineering! Participants live on-campus during the camp and participate in a variety of workshops that will give them hands-on experience with high-tech equipment and processes.

## **Women in Technology International**

<http://www.witi.com/>

Since 1989, WITI has been the first and only global association dedicated to advancing women through technology. Offers worldwide networking structure, educational and leadership programs, and outreach to women at all levels, from girls to executives.

## Websites (con't)

### Safety

#### **Environmental Protection Agency (EPA)**

<http://www.epa.gov>

#### **Hand and Power Tool Safety**

[http://www.cdc.gov/nasd/menu/topic/machinery\\_hand.html](http://www.cdc.gov/nasd/menu/topic/machinery_hand.html)

Safety lesson plans and documents.

#### **Laboratory Safety Institute**

<http://www.labsafety.org/>

The Laboratory Safety Institute (LSI) is a non-profit, international educational organization for health, safety and environmental affairs. The Institute's mission is to make health and safety an integral and important part of science education, our work, and our lives.

#### **MSDS on the Internet**

<http://www.ilpi.com/msds/index.html>

Information about MSDS and where to find them. Links to government sites.

#### **Online Material Safety data Sheets**

<http://msds.uwsa.edu/>

This is a very useful site related to chemical use. It has critical safety and health information for more than 160,000 chemical substances.

#### **OSHA**

<http://www.osha.gov/>

This is a general OSHA site with index.

#### **Science Education Safely**

<http://csss.enc.org/safety>

Free guide to schools published by Council of State Science Supervisors (CSSS) with support from the American Chemical Society, the Eisenhower National Clearinghouse for Mathematics and Science Education, the National Aeronautics and Space Administration, Dupont Corporation, Intel Corporation, American Chemical Society, and the National Institutes of Health.

#### **The Training Network**

[http://www.safetytrainingnetwork.com/company\\_info.shtml](http://www.safetytrainingnetwork.com/company_info.shtml)

Safety Training Videos, CDs, Safety Kits, OSHA Compliance Manuals etc. Have videos for hand tool safety.

## Websites (con't)

### **Software**

#### **Concerto RightForce Workforce Management**

<http://www.concerto.com/>

Enterprise-wide workforce management application that addresses a diversity of staff scheduling needs, allowing efficient response to multiple customer demand sources.

#### **DataWorks Corporation/Epicor**

<http://www.dataworks.com>

Advanced ERP system for mid-sized manufacturer. Operational on Windows NT.

#### **Fourth Shift Corporation**

<http://www.fs.com/>

An enterprise software for mid-sized manufacturers. Site offers extended enterprise resource planning (ERP) including manufacturing, operations, financials, workflow, e-business, human resources, and customer and supplier relationship management.

#### **Minitab**

<http://www.minitab.com/education/default.aspx>

Statistical software with graphic interface. Students and instructors can download free demos or rent or purchase Minitab products online at tremendous savings directly from e-academy.com.

#### **Microsoft Visio**

<http://office.microsoft.com/en-us/FX010857981033.aspx>

Visualize and communicate ideas, information, and systems; business and technical charts and graphics.

#### **Microsoft Excel**

<http://www.microsoft.com/office/excel/prodinfo/default.mspx>

Spreadsheet and data analysis tool.

#### **Microsoft Project**

<http://www.microsoft.com/office/project/prodinfo/default.mspx>

Project management software.

#### **National Instruments LabVIEW**

<http://www.ni.com/labview/>

A graphical development environment for creating flexible and scalable test, measurement, and control applications.

#### **Novell Groupwise**

<http://www.novell.com/products/groupwise/>

A secure, dynamic collaboration solution for project development.

## Industrial Manufacturing

CIP No. 15.0600

### Master of Engineering Partnership

<http://triuniv.engr.arizona.edu/>

How about the best of the best! The University of Arizona, Arizona State University and Northern Arizona University have teamed up to provide a unique opportunity to study master's level engineering on-campus and online at all three schools. To meet your demanding schedule, a wide variety of courses and delivery formats are available including on campus, online and distance. Many students initiate projects that complement their professional practice. You select your "home" campus by degree and then take off.

### University of Arizona:

Graduate Certificates

Systems Engineering

Quality/Reliability

Technical Engineering Management

Graduate Degrees

Master of Engineering

Master of Science

### Northern Arizona University

Master of Engineering

### Arizona State University

Master of Engineering

Microelectronics Packaging

Modeling & Simulation

Quality & Reliability Engineering

Semiconductor Processing and Manufacturing

Master of Science in Engineering

Master of Science in Materials Science Engineering

Graduate Certificate in Statistics - Six Sigma Black Belt

Six Sigma Professional Certifications

White Belt Program

Green Belt Program - Commercial

Green Belt Program - Industrial

Black Belt Program

### **Arizona State University**

#### **College of Applied Technology – ASU East**

**<http://technology.east.asu.edu/>**

Arizona State University's East campus has a polytechnic focus and mission. The College of Technology and Applied Sciences offers programs in Engineering, Engineering Technology, Industrial Management and Mechanical and Manufacturing Engineering. State of the art CNC machining lab and semiconductor manufacturing lab.

### **Ira A. Fulton School of Engineering – ASU Tempe**

**<http://www.fulton.asu.edu/fulton/>**

School of engineering on the Tempe campus offers free “distinguished guest lectures” series throughout the year. Usually scheduled for 4:00 – 6:00 pm. See the College calendar for details:

<http://events.asu.edu/cgi-bin/webevent.cgi?userid=guest&calID=293&cmd=listmonth>

### **ASU Ira A. Fulton School of Engineering**

#### **Center for Professional Development – ASU Online**

**<http://cpd.asu.edu/>**

Try a short course on lean manufacturing, six sigma or an online master's degree program, there's always something new and interesting at the Ira A. Fulton Center for Professional Development. Lean Manufacturing Certification or an interdisciplinary M.S.E. with an emphasis in Semiconductor Processing and Manufacturing available.

### **Maricopa Community College District**

#### **Maricopa Advanced Technology Education Center (MATEC)**

**<http://www.matec.org/index.htm>**

Throughout the year MATEC offers professional development workshops on a variety of topics related to semiconductor manufacturing technology. The workshops are designed to upgrade instructional and technical skills and provide professional growth opportunities in semiconductor manufacturing and related fields. Since 1996, over 1000 faculty and industry trainers have attended MATEC professional development events at a variety of sites.

## **University of Arizona Continuing Educations and Academic Outreach**

**Distance Learning** <http://www.eu.arizona.edu/dist/noncredit.html>

Non-credit Professional Development Courses available in 1D2-inch SVHS cassettes, 1D2-inch VHS cassettes, or CD-ROMs. Programs available in Aerospace & Mechanical Engineering, Electrical & Computer Engineering, Optical Sciences, Reliability and Quality Engineering, Statistics and Mathematics, or Systems and Industrial Engineering.

## **Continuing Educations and Academic Outreach**

Professional Development <http://www.eu.arizona.edu/professional.html>

Specialized certificates and degree programs using video, CD-ROM, and Web technology. Engineering and Optical Sciences courses are featured, as are a Master of Engineering degree that can be completed entirely at a distance.

## **Industry Resources**

Arizona Association of Industries (AAI)

**Phone (602) 252-9415**

<http://www.azind.org/>

The Arizona Association of Industries (AAI) is the largest manufacturing/industrial trade association in the state of Arizona. AAI is also the state affiliate to the National Association of Manufacturers. Look for member events.

## **Arizona Quality Alliance**

<http://www.arizona-excellence.com/>

A dynamic organization that cuts across industries, AQA provides the information and opportunities necessary to help Arizona organizations succeed - both financially and operationally. We provide a cooperative atmosphere for organizations in Arizona to excel in total quality management principles and organizational excellence. AQA addresses the very issues of efficiency, productivity, and effectiveness through workshops, informative meetings, a newsletter and networking opportunities. They also sponsor the AZ State Quality Award program. Finally, how about a study tour to Japan with the author of Kaizen!

## **Arizona Society of Professional Engineers (ASPE)**

<http://www.azspe.org/>

Four active chapters state-wide serve the individual needs of professional engineers: *Central* and *Papago Chapters* in the metropolitan Phoenix area; *Southern Chapter* for Tucson and Southern Arizona; and *Western Chapter* for Yuma and surrounding vicinity. Check the Web for chapter meeting information and current events.

### **Arizona Tooling and Machining Association**

**<http://www.arizonatooling.org/>**

Our member companies are engaged in precision custom manufacturing, including contract machining, tool & die making, mold building and building of special purpose machines for all industries. Check website for upcoming chapter events.

### **Institute for Supply Management**

**<http://www.ism.ws/>**

Located in Tempe, ISM is the largest supply management association in the world as well as one of the most respected. ISM's mission is to lead the supply management profession through its standards of excellence, research, promotional activities, and education. Lots of professional development opportunities.

### **Intel Faculty Work Program**

**<http://www.intel.com/community/arizona/education.htm#Development>  
e-mail [eugenia.r.echols@intel.com](mailto:eugenia.r.echols@intel.com) or call 480-554-4538.**

A program whereby both HS & College faculty that teach math, science, or electronics related classes do an internship at Intel during the summer in an effort to gain more understanding of the role of the manufacturing technician and the semiconductor process.

### **Klein Educational Systems**

**<http://www.kleinedu.com/index.html>**

Technology curricula and training hardware. Teacher training. Arizona rep is Linda Clark [Linda@kleinedu.com](mailto:Linda@kleinedu.com) (480-348-7797).

### **Society of Manufacturing Engineers**

**[http://www.sme.org/cgi-bin/events\\_expos.pl?inter\\_edu.html&&&ENTER&](http://www.sme.org/cgi-bin/events_expos.pl?inter_edu.html&&&ENTER&)**

SME's LearningCenter offers instant access to over 1,200 web-based courses on topics such as Six Sigma, Lean Manufacturing, GD&T, Metal Cutting, Workholding, Materials, CNC, Metal Forming, OSHA, and more.

Locally, SME has professional chapters in Phoenix and Tucson. Contact Chapters for local event schedules.